

Enhancing Computerized Provider Order Entry (CPOE) for Neonatal Intensive Care

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The authors describe design, implementation, and use of a new order entry system module for neonatal intensive care. WizOrder is a Computerized Provider Order Entry (CPOE) system developed at Vanderbilt University Medical Center^{1,2}. Since WizOrder's introduction in 1995, it has been continually refined and enhanced; especially when new hospital units and specialties are implemented. Recently, in March 2003, WizOrder was updated and implemented in the Neonatal Intensive Care Unit (NICU). At Vanderbilt, the NICU consists of seven rooms with a maximum census of 58 babies. WizOrder was in use on 536 of 604 beds prior to NICU implementation (the remaining beds are in the Clinical Research Center, which includes outpatient and inpatient beds). Over 12,000 orders are entered each day with approximately 70% entered by physicians (the remaining 30%, such as verbal orders, are entered by the appropriate member of the care team).

While other Vanderbilt general pediatric units have used WizOrder since 1997 and the Pediatric Critical Care Unit (PCCU) went "live" in December 2001, the NICU required new approaches to drug dosing and fluid management. A method to ensure precise and highly specialized (for neonates) drug dosing was needed. A new relational model was incorporated into WizOrder to allow individualized medication dosing and instructions based on the patient's age, gestational age, dosing weight, and body surface area (if required). This advance will benefit all pediatric patients and may be expanded to customize dosing for geriatric and renally impaired patients. The concept of dosing weight was introduced to account for weight loss in the days after birth and also to accommodate fluid imbalance in patients and is communicated to the pharmacy. Additional warnings based upon a maximum single dose threshold were added to existing maximum daily dose warnings. Weight based doses are also rounded to standardized doses. Additionally when the patient's weight changes significantly, existing orders are scanned for review since the dose may no longer be appropriate for the new weight.

A total parenteral nutrition (TPN) ordering module was created within WizOrder since NICU patients often receive TPN³. TPN represents a major source of fluid and drug therapy for those patients. TPN contains multiple components and is compounded daily, creating unique workflow and order entry requirements. WizOrder intravenous (IV) medication advisors created for the PCCU were modified to support the NICU. An IV fluid management advisor was also created for ordering replacement and maintenance fluids. The TPN, infusion, and IV fluid modules perform dose range checks and other safeguards to ensure patient safety and quality of care.

An interdisciplinary team consisting of NICU unit staff and physicians, the WizOrder developers, and System Support services was formed to plan for the implementation. The team flowcharted existing workflow and redesigned the ideal workflow that integrated CPOE. Implementation of the NICU involved identifying hardware requirements; configuring WizOrder ordersets and notification mechanisms; coordinating with ancillaries; communication with other information systems; and, planning a staged implementation across the multiple NICU rooms. Implementation was completed during a three week installation period. The theater style demonstration will provide examples of all new features in WizOrder developed for the NICU.

References

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